

Work Order ID 58500

May 7, 2010 2:25:33 PM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 07/05/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 24/05/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Handwritten signature

Date: 10-5-07

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D2580

Rev D

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A *HJ*

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

M 10/5/13

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

4- Scribe batch number insied aft end of tube.

) 11/05/13

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

①

BE 10/05/14

W/O:		WORK ORDER CHANGES					
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Run Start



Stop



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140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R□□□ Aluminum Rod

M112860

BE 10/05/14

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R□□□ Aluminum Rod

M112860

BE 10/05/14

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

11/05/17

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Deburr

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

11/05/18

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

11/05/17

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

11/05/18

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Stop

Sequence ID/
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Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Memo

0.00

Quality Control

S 10/5/10

160

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

S 10/5/10

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

①

BR 10-5-10

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Work Center ID

Operation
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Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180



Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

11114207

0.00

0.00

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

10:30AM

320°F

11:00AM

→ 10/05/19

41

0

190



QC

Quality Control

QC3- Inspect Part Finish

0.00

0.00

Memo

①

10-5-20.

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Run Start



Stop



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200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291

Sikaflex expire date:

M 112 429
10/08

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291

Sikaflex expire date:

M 112 429
10/08

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch:

*1141132**① BR 10-5-21*

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Required Date: 24/05/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control	Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024								
220	Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD205-634-041								
	Location: _____								
	PPP Rev: <u>6/17</u> 58221								
230	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

S 10/05/25

④

P 10/05/31 ④

10/06/01
mr
10-5-31

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 IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 07/05/2010

Required Date: 24/05/2010

Start Qty: 1.00

Required Qty: 1.00

D2580-1 Manufactured No 110 Each 9.0000 1



205 Skidtube bent detail

Location	Loc Qty	Loc Code
LG	9	
57028	1	
57347	1	
57902	1	
57938	2	
58090	2	
58112	2	

DS8 384 ① 11/5/13

D2576-3 Manufactured No 140 Each 110.0000 1



Step (maching detail)

Location	Loc Qty	Loc Code
LG	110	
46661	62	
52215	48	

1 BE 10/05/14

D2579 Manufactured No 140 Each 193.0000 20



Crossbolt Spacer

Location	Loc Qty	Loc Code
LG	193	
57052	13	
57348	180	

20 BE 10/05/14

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 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D2855 Manufactured No 200 Each 105.0000 1



Cap



Location	Loc Qty	Loc Code
FP6	2	
56613	2	
ST026	103	
50513	1	
50770	29	
51539	19	
53791	54	

1 BR 10-5-21

AN3-5A Purchased No 200 Each 963.0000 2



Bolt



Location	Loc Qty	Loc Code
ST350	963	
105057	963	

2 BR 10-5-21

AN960JD10L Purchased No 200 Each 4,297.000 2



Washer



Location	Loc Qty	Loc Code
ST348	4297	
110985	4297	

2 BR 10-5-21

ALS7-1032-130 Purchased No 200 Each 17.0000 50



Insert



ALS4-1032-130

Location	Loc Qty	Loc Code
ST282	17	
113238	17	

50 BR 10-5-21

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 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 07/05/2010

Required Date: 24/05/2010

Start Qty: 1.00

Required Qty: 1.00

AN3C4A Purchased No 200 Each 1,939.000 50



BOLT

Location	Loc Qty	Loc Code
ST350	1939	
114103	501	
114108	300	
114416	138	
114523 ✓	1000	

AN960C10L Purchased No 200 Each 0.0000 50



washer

D3566-13



Gasket

NAS 1149C0332R

114341

50 Bk 10-5-21
 50 Bk 10-5-21

Manufactured No 200 Each 33.0000 1

Location	Loc Qty	Loc Code
FP	33	
53461 ✓	33	

D3566-5 Manufactured No 200 Each 21.0000 1



Gasket

Location	Loc Qty	Loc Code
FP015	21	
57526	1	
57682 ✓	20	

1 Bk 10-5-21
 1 Bk 10-5-21

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Shop Packet Print

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IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 07/05/2010

Required Date: 24/05/2010

Start Qty: 1.00

Required Qty: 1.00

D3566-1 Manufactured No 200 Each 41.0000 2



Gasket

Location

Loc Qty

Loc Code

FP015

41

57715 ✓

20

58182

21

2 BR 10-5-21

D3564-11 Manufactured No 200 Each 9.0000 1



Wearshoe

Location

Loc Qty

Loc Code

FP019

9

57957 ✓

9

1 BR 10-5-21

D3564-13 Manufactured No 200 Each 27.0000 1



Wearshoe

Location

Loc Qty

Loc Code

FP17

27

56533

1

57684 ✓

12

57922

14

1 BR 10-5-21

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IPP Rev. O 06.02.28 Added paperwork EC
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 07/05/2010

Required Date: 24/05/2010

Start Qty: 1.00

Required Qty: 1.00

D3564-9 Manufactured No 200 Each 22.0000 1



Wearshoe

Location	Loc Qty	Loc Code
FP	1	
55334	1	
FP019	21	
57685 ✓	7	
57958	14	

1 BR 10-5-21

D3564-5 Manufactured No 200 Each 7.0000 1



Wearshoe

Location	Loc Qty	Loc Code
FG	1	
58709	1	
34806	1	
FP19	6	
57525	1	
57729	5	

1 BR 10-5-21

D2594-3 Manufactured No 200 Each 407.0000 16



O-Ring, 205 Skidtube

Location	Loc Qty	Loc Code
FP	407	
55546 ✓	19	
58191 ✓	388	

16 BR 10-5-21

May 7, 2010 2:25:38 PM

Shop Packet Print

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IPP Rev. O 06.02.28 Added paperwork EC
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D2594-1

Manufactured No

200

Each

382.0000

16



Plug, 205 Skidtube

Location

Loc Qty

Loc Code

FP

382

42807

112

55002

128

57826

142

58434

16 DR 10-5-21

W/O:		WORK ORDER CHANGES					
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DART

DESIGN <i>[Signature]</i>	DRAWN BY <i>PH</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07-06-28 *[Signature]*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

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WITHOUT NOTICE
WORK ORDER
NO. 58500

*BS10-5-01***GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL $\varnothing 0.297$ HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

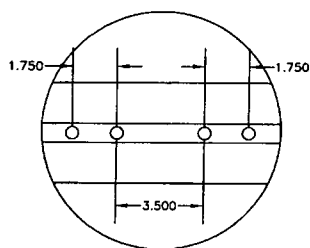
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

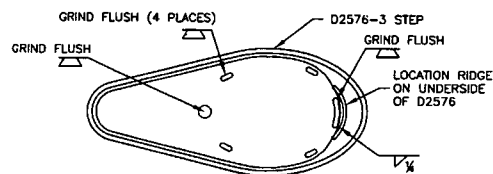
NOTE: Date & initial all entries

DETAIL A
SCALE 5:24

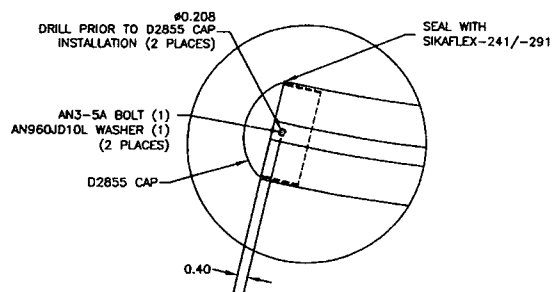


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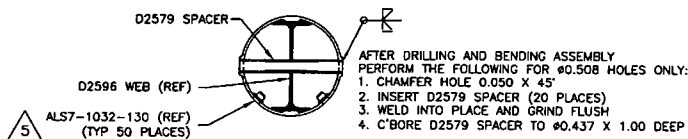
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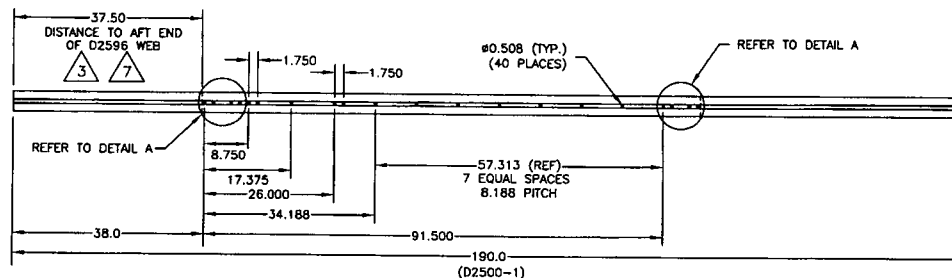
DETAIL C
SCALE 5:24



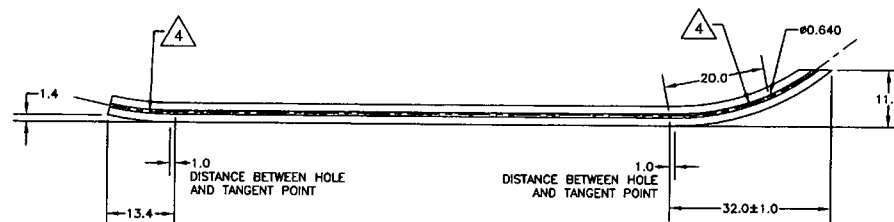
SECTION D-D
SCALE 5:24



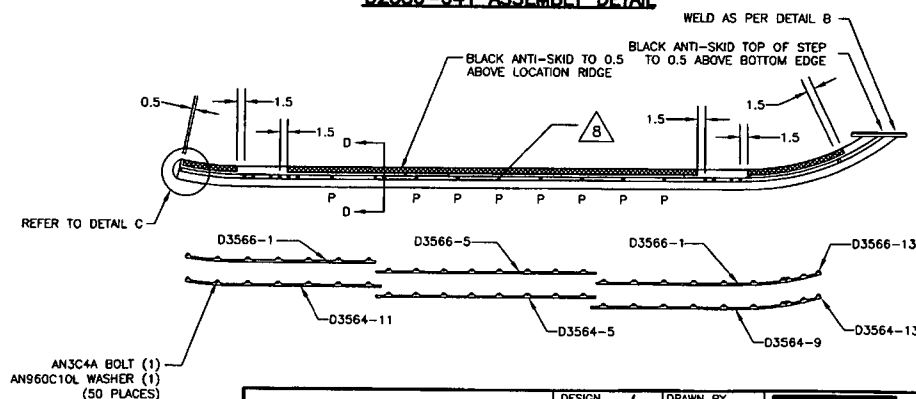
D2580-1 DRILLING DETAIL



D2580-1 BENDING AND CUTTING DETAIL



D2580-041 ASSEMBLY DETAIL



D2580-041 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

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CHECKED	APPROVED	DRAWING NO.	REV. D
DATE		D2580	SHEET 2 OF 3
07.02.27		TITLE	SCALE
		205 SKIDTUBE ASSEMBLY	1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Diagram illustrating the grinding locations for the propeller cross-section:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576
- GRIND FLUSH

Technical drawing of a circular component with the following annotations:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)
- 40.208
- SEAL WITH SIKAFLEX-241/-291
- AN3-SA BOLT (1)
- AN960JD10L WASHER (1)
- (2 PLACES)
- SEE NOTE ii)
- D2855 CAP
- 0.40

D2579 SPACER

D2596 WEB (REF)

AL57-1032-130 (REF)
(TYP 50 PLACES)

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø.437 X 1.00 DEEP

5

- i) **FINISH:** ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

[illegible][illegible][illegible]

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DATE	07 02 27

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APPROVED	[Signature]

DRAWING NO.
D2580

TITLE
205 SKIDTUBE ASSEMBLY

REV. D
SHEET 3 OF 3
SCALE
1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 232

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 58508
Part number: D205 634 041
Description: 205 tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier P. J. P. P. Date of Test Coupon 10.05.18
Welder Barclay Elliott Date of Test Coupon 10.05.18

The above named individual is qualified in accordance with AWS D17.1.2001 to weld